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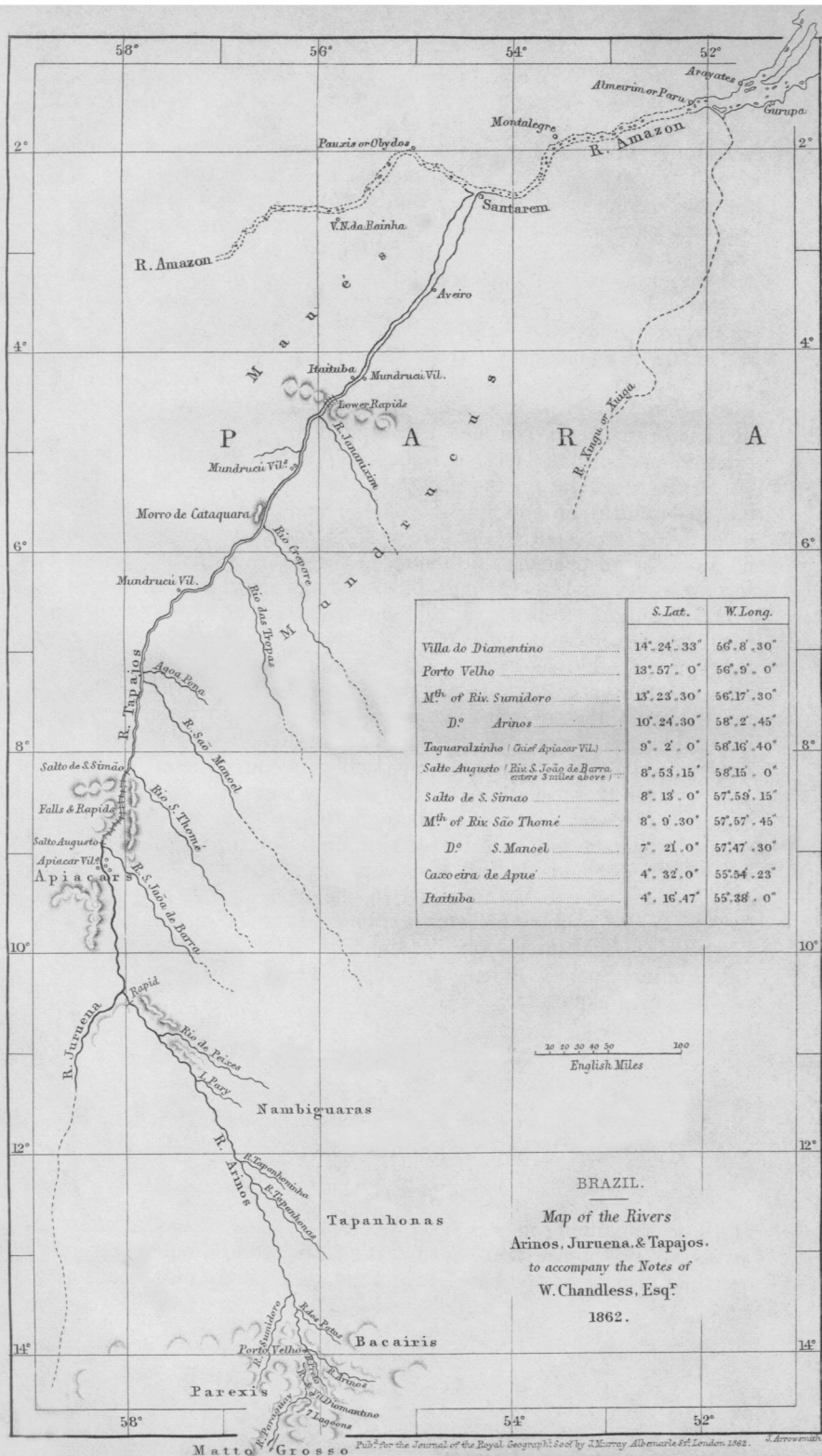
beautiful. When living in their native element, the various sorts of coral are covered with a gelatinous matter of the finest colours ; and looking out of a boat on a sunny day on the groves of coral, sea-fans, sponges, and polypi, with the brilliant colours dancing in the unsteady water, and gaudy fish gliding about among the branches, one can imagine himself looking through some brilliant kaleidoscope.

Immense lobsters, conchs, and whelks the size of a man's fist, are found in abundance at these coral-keys, and also a huge crab about the size of a soup-plate, with a lovely pink shell, spotted with white. Hermit-crabs roam at night over these little islands, disturbing the weary boatmen by biting their toes, fingers, or any exposed part of the body, and demolishing any remains of food left in the pots ; during the day they have all disappeared, snugly hid under little tufts of grass or at the roots of trees. In the quiet bays, protected by coral-reefs from the trembling breakers, flocks of grave pelicans sail about on the water, with their heads thrown back, and their long bills resting on their breasts, or tumble headlong from the air among the shoals of sprats, driving them in a silvery shower out of the water. The predaceous frigate-bird pursues the snowy seagull screaming round the bay, and amusing the spectator with its manœuvres to escape, till wearied out it lets fall the coveted fish, which is seized by the other before it reaches the water ; along the glaring sandy beach parties of little snipes and sand-pipers scamper along in eager pursuit of their prey, which is washed up in the rolls of seaweed by the little waves. The white circle of breakers on the reef, the dark blue sea outside, the calm bay with its back ground of rich foliage, and the light feathery clouds drifting over with the steady trade wind, form a *coup d'œil* only to be imagined in the dark and stormy north. The Mosquito country presents a rich field for the naturalist ; its plants, birds, and insects will be found different from those of the surrounding Spanish states, and it has scarcely been visited by any scientific explorer.

XVIII.—*Notes on the Rivers Arinos, Juruena, and Tapajos.* By
W. CHANDLESS, Esq.

Read, May 12, 1862.

THE accompanying map is not offered as by any means accurate in detail, my observations having been far too few, chiefly owing to the difficulty of finding clear ground, and partly on account of



bad weather. The latitudes of the following points may, I believe, be relied on, at any rate, as correct to the nearest minute:—

	Latitude S.			Longitude W.		
	°	'	"	°	'	"
Villa do Diamantino	14	24	33	56	8	30
Porto Velho	13	57	0	56	9	0
Mouth of River Sumidoro	13	23	30	56	17	30
Mouth of River Arinos	10	24	30	58	2	45
Taquaralzinho (chief Apiacar village)	9	2	0	58	16	40
Salto Augusto (river S. João de Barra enters 3 miles above)	8	53	15	58	15	0
Salto de S. Simão	8	13	0	57	59	15
Mouth of River São Thomé	8	9	30	57	57	45
Mouth of River S. Manoel	7	21	0	57	47	30
Caxoeira de Apué	4	32	0	55	54	23
Itaituba	4	16	47	55	38	0

The rest of the observations were taken at unimportant points: none were taken between the S. Manoel and the lower rapids, so that that part of the river is mapped from dead-reckoning only. The longitudes are given as approximations only, being the results of a single chronometer: they depend also to some extent on the longitude of Diamantino; that I have given is the mean of seven sets of lunar distances—four west, and three east. Having broken both my barometer and a sympiesometer (the latter kindly lent me by C. B. Lane, Esq., C.E., the chief engineer of the Brazilian Government), I had no means of ascertaining the height above the sea. The tributaries I have marked merely to indicate the position of their mouths, not as implying any knowledge on my part regarding their actual course.

The various streams that run from the province of Matto Grosso northwards to the Amazon, or south to the River Plate, all take their rise in what, though commonly called a serra, has in reality nothing of a mountainous character. It is simply a high range of country, varying but little in its general elevation, though deeply grooved by the valleys of the rivers: around these one finds more or less of virgin wood; the rest is "campo," that is pasture-land sprinkled more or less thickly with stunted trees, in parts including the quina-tree, the same the people told me as that of Peru and Bolivia, though here but little use is made of it. This range seems to consist mainly of sandrock and clay: in general it drops steeply and often precipitously to the lower country, the plain below appearing as a sea with deep bays and inlets. At the foot of the range, in one of these inlets, stands the Villa do Diamantino (in lat. $14^{\circ} 24' 33''$ s.; in long. about $56^{\circ} 8' 30''$ w.): the River Paraguay rises about $10\frac{1}{2}$ miles south, and $4\frac{1}{2}$ west of this; but its course at first being north-east, it enters the plain 2 or 3 miles to

the eastward, and gradually bending west, passes some 3 miles south of the town, this being its most northerly point. The River Diamantino, on the contrary, comes from the north, and passing close by the town falls into the Paraguay 5 or 6 miles below; its whole length, omitting the smaller bends, not being, I think, over 15 miles. The River Preto rises about 10 miles east of the town, and the port on it is about 15 or 16 miles north-east, as the crow flies. Canoes have now and then been brought over the watershed: while I was at Diamantino, one of about 15 cwt. burden that had come from near Santarem crossed and went down the Paraguay to Villa Maria. The River Preto from the port to its mouth is a narrow stream, as tortuous as a meadow-brook, never more than 20 yards and seldom 15 yards wide; and often completely barred by trees fallen across from bank to bank: as far as I could see, not a single stream enters it during the whole distance. A few miles below the mouth of the River Preto (which enters on the left) is the Porto Velho, or old port of the Arinos, almost exactly north of Diamantino: on account, however, of the distance and bad road it is now not much used.

The River Arinos here is about 70 yards wide; its current $1\frac{1}{2}$ miles an hour at this time (June) except on shallows; wood on each side, the ground in general only a few feet above the river-level. In a few places there are high clay-banks, almost cliffs; at one of these, the Barranco de Pitas, on the left bank, there was formerly a settlement, the *cascalha* (diamond formation) being rich. Lower down, at the mouth of the River dos Patos, a small tributary, the Bacairís, a small and very timid tribe of Indians, used to be met with; but, owing to the attacks of stronger tribes, they have latterly withdrawn more towards the head-waters of the Arinos. Ten or 12 miles above the Sumidoro, also, there was another settlement chiefly of cattle-farmers; but it has been long since abandoned. The distance from the Porto Velho to the mouth of the River Sumidoro is barely 40 miles in a straight line, but by water 80 miles or more, as the river winds very much here, some reaches even running nearly south-east.

The River Sumidoro is about 40 yards wide at its mouth; it enters with a strong stream of exceedingly clear water, and at once sensibly widens the Arinos. Some years ago the Government of the province sent a party to explore this river; they reported it not navigable, as in parts the water passes under rocks; they prevailed on the Parexis Indians,* an indolent, inoffensive tribe,

* I made a list of a good many of their words, which I have since lost. The names of the various parts of the human body mostly have the prefix "no:" for example, "nosopos," the eyes—rather an European looking word; "nocanahá," the arm; "notodoní," "nocodomi," "nocantí," "noti," other parts of the body; but "noniti," the necklace of beads. "Coriogho," a bow; "aicorí," arrows; "olatá," a comb; "kesé," a knife. These are all I can recollect.

settled near its head-waters, 10 or 12 leagues from Diamantino, to move nearer to the town, where they occasionally come to trade, chiefly in the sale of sieves, whence they are now more commonly known as "Penneireiros." A day's journey below the Sumidoro, one is in the country of hostile Indians, the Tapanhonas and Nambiguaras, who frequent both banks of the river, but chiefly the right bank. These Indians have frequently attacked passing canoes, and seem to reject all attempts at intercourse. Senhor Benedicto França, a gentleman I met at Diamantino, and who gave me much information respecting these rivers, told me that on one of his voyages down he left looking-glasses, knives, &c., at most of the places of resort of these Indians: on his return some months later, at one of these places the Indians beckoned to him, and when he got close began to shoot at him; at other places he found they had examined the things he left, but carried nothing away. Here the river widens, and the reaches are much longer, and vary less from the general direction. Hereabouts, too, the bacava and inajá palms begin to appear: higher up one sees only the pindorval and buriti; from groups of the latter palm, towards evening, the blue and yellow macaws flew out as thick as rooks around a rookery. The maté-plant was pointed out to me on this upper part of the river, but it is a plant I am not acquainted with myself.

About lat. $11^{\circ} 30'$ s. the river becomes rocky, and separates into numerous channels, forming a labyrinth of islands, among which the currents and eddies are very strong, and there are several difficult rapids; all, however, passable down-stream with rowing. With short intervals of smooth water, the river continues of this character for many leagues. Nearly opposite the mouth of the Igarapé Pary, I saw gorgulha* along the left bank for several hundred yards: some years ago Senhor Benedicto washed several pans of this gorgulha, and found gold and the different pebbles that mark the diamond formation, but did not excavate deep enough to reach the cascalha. Here one begins to see the assaí-palm and the large chesnut-tree which bears the Brazil-nuts; along with these, too, commences what the boatmen well call the "plague of piuns," a small fly but a great torment; when taking observations in the daytime, I have often been obliged to get some one to fan me. Some 10 miles above the River de Peixes there is a good deal of granite along the river, and many immense lumps in the middle, some not covered even by the highest floods: the ground, however, on each side is not hilly. Below, the river is

* Gorgulha is a formation very commonly found overlying the cascalha, with a layer of earth between the two: it generally contains a great deal of broken quartz, and but few diamonds. Near Diamantina, in Minas Geraes, it was often thought worth washing; but near Diamantino, in Matto Grosso, very rarely.

smooth and still, but seldom in one channel, owing to a succession of islands, mostly large; one of them 5 or 6 miles long, and of considerable width.

The River de Peixes is the largest tributary of the Arinos, its mouth being fully 100 yards wide, and the Arinos at this point 200 to 250 yards. This river has never been explored: many years ago, one Padre Lopes went a short distance up it in search of the Martyrios, an El Dorado much believed in by Cuyabanos, though on very slight evidence; but owing to attacks of Indians and desertions of his slaves, he soon turned back. A ledge of rocks only a few yards wide runs across from the mouth of the River de Peixes to the left bank of the Arinos, though in several places completely broken through by the force of the current; it was, however, now scarcely above water, so that one could see but little of its nature. There are sundry ridges of hills hereabouts, but only 300 or 400 feet high; though, owing to the flatness of the country above, they had been in sight for many hours.

About halfway from the River de Peixes to the River Juruena, the river again becomes streamy, and there are two or three rapids; at the last of these, the only one on the Arinos at which even upstream canoes have to unload, the river is very wide and shallow; but below narrows again to 350 yards or less, where clear of islands: the islands, however, are large, and for many miles at a time divide the river into two distinct channels. The Arinos falls into the Juruena with a width of 300 yards; the latter being fully 500 yards wide, and the united river a little below not less than half a mile: but is so studded with small islands and divided by large ones, that hereabouts one can seldom see its whole width at once. The right bank is considered uninhabitable on account of the large ants (*traquás*), and Indians are never seen here. Some 6 leagues below the mouth of the Arinos, the Juruena passes over an immense undulating bed of granite, which often rises above water in smooth, shelving masses, here called "*lages*," and thus forms the heads of many islands: there are several rapids here, one very long and intricate; but the rapids of the Juruena below being so much greater than those of the Arinos, these have no distinctive names, and are scarcely even treated as *caxoeiras*.* In the woods here the most noticeable tree is the *masaranduba* ("milk-tree"—Wallace), a tree, I think, not found on the Arinos, for one could hardly fail to notice it, the withered leaves at this time being just the colour of young pomegranate-leaves: lower

* On these rivers the term "*caxoeira*" is equivalent to "*rapid*," a fall being invariably treated as "*salto*;" a distinction not made in all parts of Brazil, as on the river São Francisco the great falls of Paulo Affonço, and many small rapids above, are alike termed *caxoeiras*.

down it was so numerous and so bare of leaves as to give the woods quite a wintry appearance. The seringeira—the India-rubber tree—begins to show itself, but the trees are not of the size found below: also the embira-tree, the inner bark of which is used for ropes to take the canoes through the rapids.

Below the lages just mentioned, the river continues smooth and with no great current till near the Apiacar villages, above which it is full of little islands and rocks, with many small rapids. The Apiacares are a small tribe, and the first one meets with that understand the Lingoa Geral: it is said that a larger portion of the tribe, not wishing to hold intercourse with the whites, broke off and settled on the Rio S. Manoel. They have about half-a-dozen villages, all on the water-side, and generally showing a good deal of taste both in the positions and in the way the wood has been cleared or left standing; the houses are very neatly walled, and thatched with pindorval-leaves, but inside all is dark and dirty, and hammocks are hung from post to post in every possible direction. Neither men nor women wear any clothing whatever: they besmear themselves with a mixture of urucú and palm-oil, which serves to colour them and to kill the “pinus.” In appearance the men are very superior to the women, and some of the younger ones handsome; they wear their hair short. Around the houses are plantations of urucú, cotton, sugar-cane, mandioca, bananas, corn, and sweet potatoes; the cultivation being at least as good as one sees anywhere in the interior of Brazil. Cotton they use only for fishing-lines and for their hammocks: in one of the houses I saw a rude sort of loom. The men occasionally work in canoes bound up-stream, but very seldom in those bound down, as they are lazy and dislike the hard work in the rapids. Salsa-parilha is the only object of trade they have to sell, and they seem to have learnt its value; anything else may be bought for a few fishing-hooks.

About 5 miles below these villages, at the mouth of the River São João de Barra, is the caxoeira of the same name, the first of the great rapids and one of the worst. There are two channels separated by a small island: I went down the left channel, not more than 50 to 60 yards wide: the current runs 10 or 12 miles an hour, with great depth and high breakers. The right channel is somewhat wider, but is considered worse; the water, however, seems to divide pretty equally, passing as through a double gateway into a large calm lake below, a mile or so wide and 2 to 3 miles long. All cargo is unloaded, and in high water up-stream canoes have also to be taken overland. Passing another caxoeira less difficult, one reaches the Salto Augusto—the great fall. By keeping close in shore along the right bank, a canoe may safely come within 60 or 70 yards of the fall; thence canoes and all

have to pass overland for about 650 yards. The rock is a sort of flagstone, with very level strata. The river has two channels: the fall on the left is perhaps the higher, but the main body of water passes on the right, with a width of 100 yards, narrowing to 80 yards or less below. The immediate fall is about 30 feet, with a second smaller one 150 yards below; and the river at this time being full, the rush of water from one to the other was very fine. This fall is considered the boundary of the provinces of Pará and Matto Grosso, and to some extent it is a natural boundary: above, the fish are mostly scale-fish; below, mostly skin-fish. The woods also become more productive, and the Apiacares say they do not find *salsa-parilha* above the fall.*

Between the Salto Augusto and the Salto de S. Simão there are 14 caxoeiras: of these, five at any rate when the river is full are easily passable without unloading; at the other nine, cargo has to be carried overland, oftener over than under 500 yards' distance. This is partly precautionary, partly to lighten the canoes, as in most of these rapids the main-channel is impassable, and the canoes are taken down side channels, with two or three men on board to keep the boat off the rocks with punt-poles, and the rest of the crew on shore with ropes to bow and stern; in this way four or five hours are often spent in passing a single caxoeira. The "Misericórdia," though passable rowing in as many minutes, is perhaps the most dangerous on the whole river, on account of the violent whirlpools which have sucked down canoe and all occasionally. The river here makes a sudden bend in and out at right angles, narrowing at the same time from considerable width into a channel not 70 yards wide, closed in by beds of rock; the

* *Rapids and Falls of the Juruena.*

- S. João de Barra.—Unload; carry cargo 200 yards.
 S. Carlos.—Pass loaded.
 Salto Augusto.
 Tocarisal.—Unload; carry cargo 100 yards.
 As Furnas.—Unload twice; 200 yards and 40 yards.
 Salsal.—Pass loaded.
 As Oudas.—A collection of small rapids among islands. Pass loaded.
 S. Lucas.—Unload; about 600 yards.
 Dobracão.—Pass loaded.
 S. Gabriel.—Pass loaded down side channel: main channel half a mile wide, and shallow, with a fall of two or three feet.
 S. Rafael.—Unload; 450 yards. River divided into about a dozen small channels by parallel islands.
 S. Iria.—Unload; 500 yards. The guaraná-plant is found wild near S. Iria in some abundance.
 Banco de S. Ursula and Canal de Inferno.—Unload twice; 600 yards and 200 yards. The Banco is almost a fall.
 Misericórdia.—Unload; 200 yards.
 S. Florencio.—Unload; 500 yards.
 Labirinto.—Pass loaded.
 Salto de S. Simão.
 Todos os Santos.—Pass loaded, except in very low water.

depth here seems great, and the current varies continually, the back-stream sometimes running strongly in the very middle.

S. Simão has a fall of about 6 feet, except in the middle of the main-channel, where the water has broken it down and made a rapid; the fall is preceded by a long rapid, and cargo has to be carried nearly half a mile. There is here a good deal of a soft white sandstone, pieces of which are generally carried off to serve as grindstones: the fall, however, seems to pass over rock very similar to that at the Salto Augusto. The difficulties of these caxoeiras may be estimated from the fact of our occupying six days in travelling from S. João de Barra to below S. Simão, a distance hardly over 60 miles; travelling down-stream, and with no other cargo than provisions and personal baggage. Some 3 miles below S. Simão is the Caxoeira de Todos os Santos, the last of the caxoeiras of the Juruena. Just below this the River S. Thomé (about 70 yards wide) enters on the right: on the left bank, opposite, is a small settlement of Mundrucús, who originally came here to work for two runaway slaves from Manaos; they all wore clothes, and understood Portuguese.

The stretch of river from this to below the S. Manoel is known as the Rio Morto; but at this time there was still a slight current. Somewhere here, though I cannot say precisely where, but certainly above the S. Manoel, the river-water changes from the clear dark green of the Arinos and Juruena above into a dull blackish tint; for which reason the river from the S. Manoel down is known as the River Preto; even at Santarem no one speaks of it by any other name. Possibly the colour of the bottom here may cause an apparent change; but below, the water is dark even over rock or white sand; a dull black, however, quite different from what Mr. Wallace describes on the River Negro.

The S. Manoel is 500 or 600 yards wide at its mouth, but seems wider a mile or two up; a little above the Juruena is half a mile wide, but at the point of junction is narrowed by an island. In most maps the S. Manoel is called River de Tres Barras, a name that seems founded on a mistake. I believe that the river has but one mouth; I travelled a good many leagues above and below, in broad daylight, and saw but one. Our pilot and others, who have made the voyage up and down more than 30 times, said they knew but of one; and the same was told me by a small party of India-rubber makers—the first we met with—in sight of the mouth. There is a large igarapé, called the Agoa-Pona, that falls into the Tapajos a little below: this, however, they assured me had no connexion with the S. Manoel, and there are ridges of hill between that make it unlikely. They had been up the igarapé five days' journey and two more by land to the Mundrucú villages on the Campinas, whence they brought their provisions. The S.

Manoel is a larger river than it appears in any map I have seen, and I believe comes from farther south. Formerly it was navigated by Cuyabanos, but afterwards abandoned for the Arinos and Juruena, the Indians on it being more hostile, and the caxoeiras worse, and consequently the navigation, though more direct, more difficult. Canoes then used to start eight days' journey from Cuyabá, which certainly would not give more than 2° difference of latitude, and therefore put the S. Manoel as navigable in lat. $13^{\circ} 30' s$. A fazendeiro also told me that in 1858 he started with others from the neighbourhood of Diamantino—say $14^{\circ} 30' s$.—to hunt up stray cattle, and in seven days' leisurely travelling they reached the S. Manoel, there 180 yards wide, but not more than breast-deep. What other information I could obtain seems also to place the sources of the S. Manoel about $13^{\circ} 30' s$.

Here one seemed to pass from the dry season of the south into the Pará weather, and for many days I was unable to get a single observation; the night and morning being cloudy, and the afternoon a succession of thunder-storms with strong winds and occasional squalls from north by north-east. Some 4 leagues below the S. Manoel, the river becomes rocky and streamy at a place known as Pesqueiro (from the abundance of fish), but only for a short distance; below, for about a dozen leagues it is very calm and still, appearing as a succession of lakes. On the left, low ridges of hill run along the water, with here and there cliffs almost hidden by the wood. The shallow of Capoeiras, about 7 miles long, was now only perceptible from its faster current; but in low water, and with up-stream loaded canoes, is very troublesome. A little below is the Chacorão, another shallow, 4 or 5 miles long: in the lower part of this, the river is $1\frac{1}{2}$ miles wide, and one has to cross nearly straight from the right to the left bank; there are small rapids here, full of large stones and lumps of rock. At the foot of the Chacorão, on the left bank, is a village of Mundrucús, whose country extends from the S. Manoel to near the Amazon on the east of the Tapajos, though most of their villages along the river are on the left bank. They are the most powerful and warlike tribe of all these sertões, and at the same time the most honest and faithful, and very friendly towards white people. They extend a sort of protection over weak tribes of Indios mansos, and carry on perpetual war with Indios bravos; none, however, dare to invade their country. On their expeditions they carry off the children of their enemies, whom they bring up and marry with their own people, thus materially increasing their own tribe: those who resist or try to escape, they kill. In one of their houses here I saw the head of a boy, of about 12 years old, who had been killed a short time previously; for it is the custom to carry off the heads and dress them up with paint and feathers. The Mundrucús are said

to indulge in cannibalism occasionally: this I have been assured by several persons well acquainted with the villages in the interior. The men wear their hair short, and all the fore-part of the head nearly bare; the face blackened all over, and the whole body tattooed in a check-pattern of black stripes. The women are better looking than the Apiacar women—no great praise. Neither sex wear clothing of any kind. The people here trade in salsa, and sell provisions to the parties of India-rubber makers. They fish chiefly with bow and arrow, and set little store by fishing-hooks.

The river below the Chacorão is smooth and wide, and generally in one channel; with very little current and long reaches—one fully 15 miles, due east by compass: indeed all this part is remarkably straight, and with very slight deviations from its general direction. Here we passed several parties of India-rubber makers; and in September, when the sand-banks are uncovered, a good many canoes come up for turtle and turtles' eggs. A little above the River das Tropas, considered the largest tributary after the Arinos and S. Manoel, the river passes through straits only 350 yards wide, but widens again directly. A few miles below we passed some small lages of a coarse red granite, and below this a very long reach, 15 or 20 miles, north-east. In this and between it and the River Creporé are two shallows, but now with plenty of water.

The River Creporé enters on the right with a width of about 70 yards: it is one of the various streams leading to the Mundrucús villages on the Campinas, the higher country dividing the Tapajos and Xingú or Xuigá waters, and said to be of exactly the same description as the campos of the south. I suppose, therefore, that in this latitude the virgin wood extends only a certain distance from the river: 3 or 4 miles below the River Creporé, on the left bank, is the Hill of Cataquara, several hundred feet high, of red calcareous rock here and there breaking into cliffs, and said to be cavernous. At the shallow of Mangabal Grande, 8 or 10 miles long, the whole river-bed is granite, with many smooth lages above water, and numerous small islands: the width varies here from 1 to 2 miles; the steering is very difficult on account of the shallow water, but the rock being all smooth there is no risk. The hills on each side are of some height, and here and there the hill-tops are open campo. A little below the Mangabal are two or three Mundrucús villages on the left bank, and the last on that side, as the Maué country begins soon below. There is still for many miles a good deal of granite in the river, but in large lumps rising out of deep water. Some 6 or 8 miles below, the river seems barred by a serra in front, and makes a bend in and out at right angles, for about its own width; just in the bend is the island *Montanha*, a hill about 200 feet high, and the only island of any height in the

whole river. Below this, on the left bank, are the houses of several Maués, who have broken off from their tribe, and settled as farmers on the river-bank; the villages are all in the interior. The Maués are the best-looking Indians I have seen, and by far the lightest in complexion. The traders say they are a very clever but a false and dishonest set of Indians; I should remark that among the Parexis, Apiacares, and Mundrucús, I have seen nothing of that tendency to pilfering which is such an annoyance to any one travelling among North American Indians. Below are the Feixos, where ridges on each side narrow the river to a short 180 yards; and below this, in the time of the Pará revolution, there was a good-sized settlement of the rebels, but no trace of it now remains.

As it approaches the lower rapids the river becomes very streamy and splits into a good many channels. There are four of these caxoeiras; the two first, the Apué and Cuatá, are the most tiresome, as the cargo has to be carried overland nearly half-a-mile at each: the canoes pass down narrow, rocky side-channels, in which ours received a good deal of damage. On an island in the Cuatá there has been some little gold-mining, and diamonds also are said to have been found. I picked up several "cattivos" and "cabroxos," the chief pebbles that mark the diamond formation. Maranhão Grande, the third caxoeira, is a good deal like that of S. João de Barra, and is considered one of the most dangerous on the whole river. Maranhão-sinho, the last of these rapids, all of which are close together, is passable without much difficulty, having great depth and very little wave, but strong eddies. These rapids, barring the free navigation of the river, have been a limit to white settlers, whose houses begin almost within sight of them. Some 6 leagues below, on the left bank, is Itaituba, the first town and the chief port of trade with Cuyabanos; before the Paraguay was opened to Brazilians, there was a good deal of trade for salt and iron, several monsoës (fleets of 10 or 15 canoes) coming down every year. These monsoës were mostly of ubás, the canoes made of a single trunk, which carry more cargo than igarités, but are heavier and less manageable: people call six months a fair up-stream voyage for a monção, and 80 days for an igarité, though the voyage has been made in 50 days. The best season for the up-voyage is a matter of much difference of opinion. Now there is no trade except for guaraná, for which some half-dozen igarités start from above about November, as the new guaraná is ready in January, and arrive again about the end of April. In the province of Matto Grosso guaraná has become as much a necessary of life as coffee in the East, and in the greater part of Brazil; the price at Itaituba was 1 mil-reis a lb.; but owing to the difficulties of the voyage, a good deal gets broken or spoilt, and 7 or 8 mil-reis a lb. is no uncommon price in Cuyabá.

As the river from Itaituba down is probably well known, it is not worth saying much: below Aveiro it widens exceedingly, being not less than 8 miles, and in parts, perhaps, 10 or 12 miles from bank to bank, till near Santarem, where it narrows again. There was no perceptible stream here, though the river was still high; and as there is generally a strong up-stream-wind all day, the smacks that navigate this part of the river often make their up-voyage in as many days as they spend weeks in coming down.

The distances by water may be about the following:

	English Miles.		English Miles.
Porto Velho	Brought forward	625
Mouth of River Sumidoro ..	80	River S. Thomé to River	
„ „ Tapanhonas ..	120	S. Manoel	80
Head of rapids of River Arinos	100	First Mundrucú village ..	80
Mouth of River Arinos ..	120	Mouth of River Creporé ..	100
Salto Augusto	140	Caxoeiro de Apuê	120
Mouth of River S. Thomé ..	65	Itaituba	25
		Santarem	170
Carry forward	625	Total	1200

The Tapajos and its tributaries are not considered to possess either great abundance or great variety of fish: the following are those we caught. Above the Salto Augusto—the *matrinção*, scale-fish; much like a roach in appearance, but cuts pink, and tastes like a sea-trout; seldom over 7 lbs. *Robafo*—scale-fish; looks much like a barbel, but without feelers, and has a slight tinge of copper-colour; largest I saw 15 lbs., said to run up to 20 lbs. The small alligator and the *cagado* or small turtle are very numerous here. I have been told that when the Arinos is low, the *anaconda* (*sucurí* or *sucurojú*) is often seen among the stones of the rapids; we saw none. Below the Salto—*pescada*, dog-fish, *piranha*—scale-fish; the first two, bright silvery fish, and frequent sharp waters, not found in many places; *pescada*, hog-backed, seldom passes 6 lbs.; dog-fish runs up to 10 or 12 lbs., looks much like a *grilse*, but with finer scales and good holders, whence its name; *iranha*, a small fish, shaped like a tench, but silvery, goes in schools, very voracious; in fishing for it one makes plenty of splash. On some of the rivers of Maranhão it is unsafe to bathe, on account of the *piranhas*, as they fix on a person as herrings are said to do. Skin-fish—*jáu*, *jundia*, *pirarara*, *pirahivas* (the *pirarucú* is only found low down on the Tapajos: we never caught one). These fish are all shaped a good deal like a codfish, large-headed, round-backed, and flat-bellied; they all have long feelers, eyes exceedingly small, and placed quite in the top of the head; teeth also quite small. The *jáu* is the shortest and stoutest

built; back of a mottled green, with dark spots. The pirarara is longer and leaner; the white of the belly extends halfway up the side into a streak of yellow, ending in a dull red towards the tail. The pirahiva is the best built, having rather a mackerel tail: this fish is said to grow to 60 lbs.; largest I saw, 32 lbs. Below S. Thomé the large turtle is abundant; the large alligator is found, but rare; I saw none till below Itaituba. Otters one sees more or less on the whole river.

The tapirs abound along these rivers, especially along the Arinos: wild pigs also; those on the Juruena are mostly "queixados," and show fight. Onças, deer, and the game found in other parts of Brazil, are, the Indians say no doubt truly, found here; but I did not happen to see them. The jacú, mutum, and cabeça-seca are the chief birds of game; ducks one sees now and then, but not in great numbers. On the Arinos and Tapajos the blue and yellow macaw abounds; along the Juruena, the blue and crimson macaw. I have never seen the two kinds together.

XIX.—*Narrative of a Journey through the Interior of Japan, from Nagasaki to Yeddo, in 1861.* By Sir RUTHERFORD ALCOCK, K.C.B., F.R.G.S.

Read, June 16, 1862.

A PAPER was read in this Society last season, giving some account of a journey in the interior of Japan, which was undertaken for the ascent of the mountain of Fusi-yama, and with the further purpose of visiting the sulphur-springs of Atami. I had intended giving an equally detailed narrative of the incidents and principal objects of general and scientific interest which came under my notice during a much more extended exploration of the interior of the country, in a journey I undertook last year, about this time, from Nagasaki to Yeddo, across the island of Kiusiu, through the inland sea to Hiogo and Osaka, the great commercial emporium of the empire, and thence overland to Yeddo, the capital of the Tycoon. I have unfortunately, however, arrived in England much too late in the season to give effect to this purpose now; and I owe, indeed, to the obliging courtesy of the President and Council the opportunity of presenting to the Society even the very brief and imperfect sketch for which I must now beg the indulgence of all who are willing to listen to it. Fortunately in my previous paper I gave such details of the general features of the country—the usual incidents of travel in Japan, and the social state and physical geography of the districts then traversed—that to those who were present, or who may since have read it in the 'Transac-